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(54) Retaining plug pin by latches

(57) A pin (2, 4) of a plug is retained in an aperture (13, 14) of the base (1) of the plug by latches (40, 41) which bear transversely on the pin at a location remote from the aperture. Latches may engage over the head (42) of a pin. The base (1) may be formed with a groove (17, 18, 37, 38) at the foot of a latch. A fuse-holding pin (3) may be formed with fuse terminals outside the latches (as shown) or within them (fig. 5, not shown)

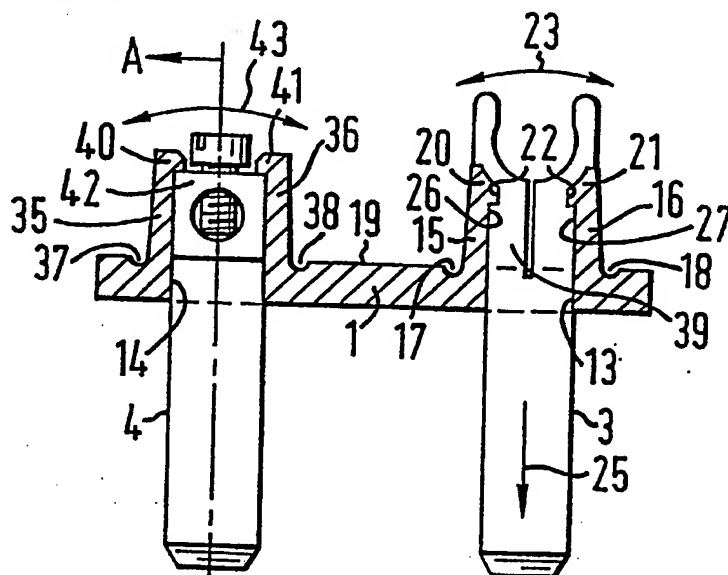


Fig. 2

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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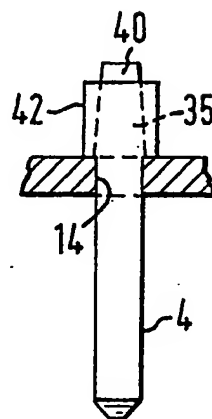
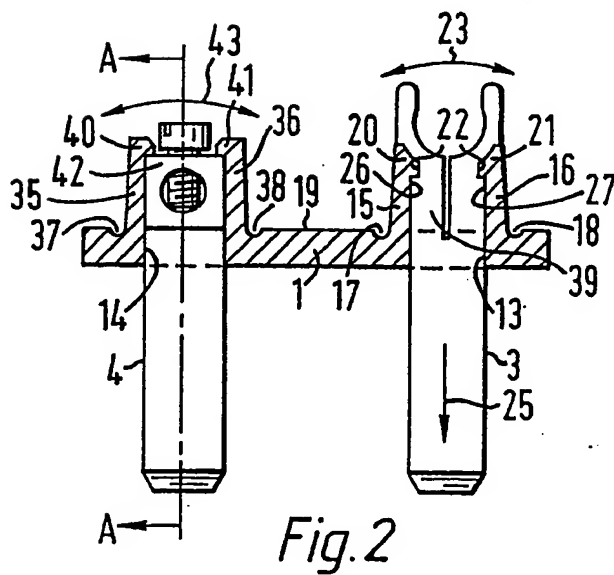
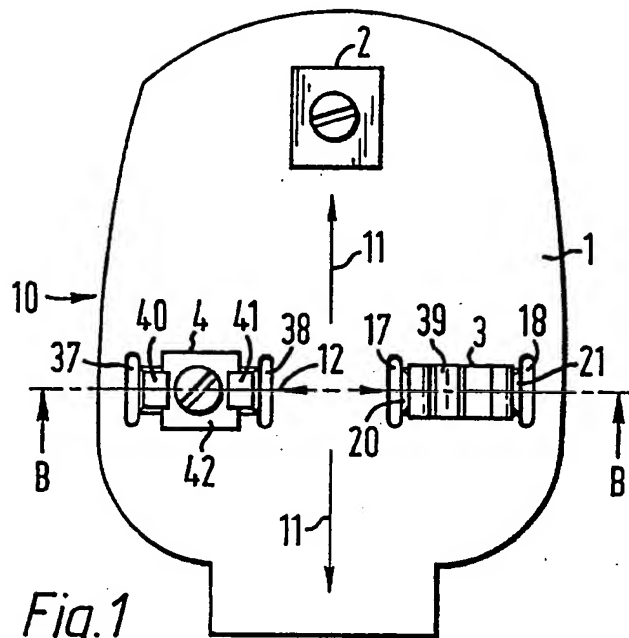


Fig. 3

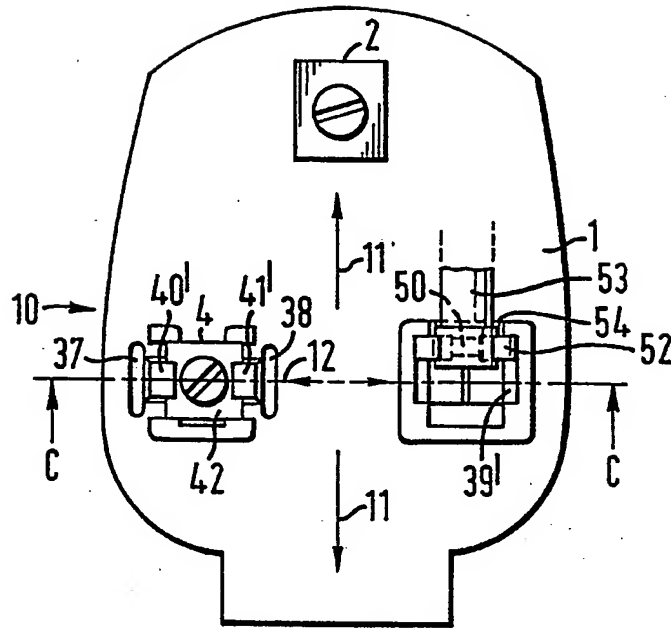


Fig. 4

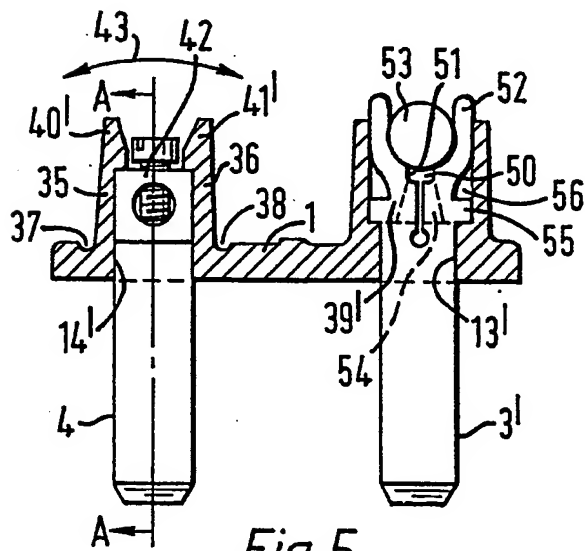


Fig. 5

AN ELECTRICAL PLUG

5 The present invention relates to electrical plugs having two or more pins and preferably three pins. The plug has a moulded base with apertures to receive the pins.

10 In GB Patent Application No. 2109179. A there is shown a three pin plug having transversely aligned line and neutral pins and a third earth pin. The transverse line and neutral pins are retained in apertures in the base by means of flexible lugs or catches which engage on sides of the pins which are at right angles to the transverse direction between the line and neutral pins. A problem with such an arrangement is each line and neutral pins is fixed
15 relatively securely for transverse movement but has some movement in the longitudinal direction. In order to conform with the relevant standard for pin location in the base, it is desirable to provide a minute amount of pin flexibility: that is perhaps 2° of movement in either direction perpendicular to the base. The arrangement shown
20 in GB 2109179.A only provides for this movement in the longitudinal direction. If the aperture sizes are increased the pins tend to wobble in the apertures. GB Patent Application No. 2138219.A shows an arrangement where
25 catches are provided transversely within the pin apertures so that the pin tends to pivot about the catches and again this can result in wobbly pins.

30 According to the present invention, an electrical plug comprises two or more pins and a moulded base with apertures to receive the pins, the base having one or more resilient catches extending therefrom which is or are arranged to retain one or more of the pins, each in its respective aperture which apertures are transverse to the
35 plug, and is characterised in that at least one said catch is arranged to beat on a transverse side of its respective pin at a point removed from the aperture on the inside of

the base.

5 The provision of the resilient catch or catches according to the invention enables the pin or pins to be held within the aperture and firmly engaged by the catch or catches which, because of the catch resilience, prevents its pin from wobbling and will have sufficient transverse movement to comply with any inaccuracies in the mounting of the pin or pins in the base or the plug socket.

10 Preferably the several catches are arranged in pairs either side of the aperture so as to engage with parts of the pins distant from the apertures. In this way full transverse flexibility is ensured in both transverse directions. The catches may engage over the tops of the pins or else into the side of the pins. The provision of grooves in the base adjacent to the roots of the catches ensures that the pins can pivot better in their apertures and assists the resilience of its catches.

20 Embodiments of the invention will now be described with reference to the accompanying drawings in which:

25 Figure 1 is a plan view of the base of a plug according to a first embodiment of the invention as seen from the inside of the plug.

Figure 2 is a transverse cross-section taken on the line B-B of Figure 1.

30 Figure 3 is a scrap view taken on line A-A of Figure 2 showing one pin with the terminal screw omitted for clarity.

Figure 4 is a plan view of the base of a plug according to a second embodiment of the invention as seen from the inside of the plug, and

35 Figure 5 is a transverse cross-section taken on the

line C-C of Figure 4.

In the drawings a moulded base 1 of a three pin plug is shown with an earth pin 2, line pin 3 and neutral pin 4. The fuse clip with terminal, the cable grip and moulding details in the base are not shown for the sake of clarity.

The plug generally shown at 10 has a longitudinal direction shown as line 11 and a transverse direction shown as line 12. Line 12 passes through the longitudinal centres of the line and neutral pins. That is the line and neutral pins 3 and 4 are transversely located in the base and are fitted respectively in apertures 13 and 14 formed in the base 1.

Spaced transversely either side of aperture 14 are two flexible and resilient catches 15 and 16 which extend from inwardly longitudinal grooves 17 and 18 in the inner surface 19 of base 1. Catches 15 and 16 terminate in latching portions 20 and 21 which engage in grooves 22 in head 39 of pin 3. The resilience of catches 15 and 16 allow slight transverse movement in the transverse direction 12 as indicated by arrows 23. That is the pin 3 is able to pivot about aperture 13 but is urged into the perpendicular direction 25 by the action of catches 15 and 16 which bear on the transverse sides 26 and 27 of the head of the pin 3 at points removed from the aperture 13 on the inside of the base.

In a similar way as previously described in relation to aperture 13 flexible and resilient catches 35 and 36 are spaced transversely either side of aperture 14 and these extend inwardly from longitudinal grooves 37 and 38. Terminating catching portions 40 and 41 latch over the top of head 42 of pin 4, head 42 being larger than aperture 14 so as to capture pin 4 between the inner surface 19 of the

base and the latching portions 40 and 41. The catches 35 and 36 have the same resilient function as catches 25 and 16 to urge pin 4 into the perpendicular direction parallel to line 25, allowing slight transverse movement in the transverse direction 12 as indicated by arrows 43.

The second embodiment shown in Figs 4 and 5 has a neutral pin 4 secured in the same way as in the first embodiment except for latching portions 40 and 41 have been extended as at 40' and 41' from the base 1. Also aperture 14' is slightly opened out to give a marginal increased flexibility in view of the different fixing pin 3'. The same reference numbers have been retained as for the first embodiment for similar features. The reason for extending portions 40' and 41' is to make pin insertion slightly easier.

Line pin 3' is however different and is fixed differently. The reason for modifying the fixing arrangements for the line pin is that the reduction of metal of pin 3 in notches 22 is critical. To avoid this criticality the latching in the second embodiment is obtained by providing a latch 50 which engages in a notch 51 at the base of 'cow horn' 52. Latch 50 extends underneath fuse 53 one end of which is shown in Figs 4 and 5. Latch 50 projects from a spigot 54 which extends upwardly from an area of the base 1 adjacent aperture 13'. The head 39' of pin 3' has lugs 55 extending transversely within chamber 56 which opens out from the inside end of aperture 13'. This pin 3' is not transversely resilient as pin 4. However pin 4 is able by its flexibility to enable sufficient transverse mobility between pins 3' and 4.

C L A I M S

- 5 1. An electrical plug comprising two or more pins and a
 moulded base with aperture to receive the pins, the base
 having one or more resilient catches extending therefrom
 which is or are arranged to retain one or more of the pins
10 each in its respective aperture which apertures are
 transverse to the plug characterised in that at least one
 said catch is arranged to bear on a transverse side of its
 respective pin at a point removed from the aperture inside
 the base.
- 15 2. A plug as in claim 1 wherein the catches are arranged
 in one or more pairs so that at least one catch is on one
 transverse side of the head of the pin and the other catch
 of the pair is on the other side of the head of the pin.
- 20 3. A plug as claimed in claims 1 or 2 wherein one of the
 pins is retained in its aperture by means of said catch or
 catches engaging over the head of the pin.
- 25 4. A plug as claimed in any one of claims 1 to 3 wherein
 one of the pins is retained in its aperture by means of a
 side catch or catches engaging in a groove or grooves in
 the head of the pin.
- 30 5. A plug as claimed in any one of claims 1 to 4 wherein
 the catches extend from the base of the plug adjacent to
 grooves formed in the plug.
- 35 6. A plug as claimed in any one of claims 1 to 5 wherein
 one of the pins is retained in its aperture by means of a
 catch acting in the head of the pin under a position where

a fuse end may be secured to the head of the pin.

5 7. A plug as claimed in claim 6 wherein one of the pins
is provided with laterally extending protrusions adapted to
keep said one pin in its aperture.

8. An electrical plug substantially as described with
reference to Figures 1 to 3 of the accompanying drawings.

10 9. An electrical plug substantially as described with
reference to Figures 4 and 5 of the accompanying drawings.

Amendments to the claims
have been filed as follows

- 5 1. An electrical plug comprising two or more pins and a
 moulded base with aperture to receive the pins, the base
 having one or more resilient catches extending therefrom
 which is or are arranged to retain one or more of the pins
 each in its respective aperture which apertures are
10 transverse to the plug characterised in that at least one
 said catch is arranged to bear on a transverse side of its
 respective pin at a point removed from the aperture inside
 the base so as to enable transverse resilient movement of
 said respective pin.
- 15 2. A plug as in claim 1 wherein the catches are arranged
 in one or more pairs so that at least one catch is on one
 transverse side of the head of the pin and the other catch
 of the pair is on the other side of the head of the pin.
- 20 3. A plug as claimed in claims 1 or 2 wherein one of the
 pins is retained in its aperture by means of said catch or
 catches engaging over the head of the pin.
- 25 4. A plug as claimed in any one of claims 1 to 3 wherein
 one of the pins is retained in its aperture by means of a
 side catch or catches engaging in a groove or grooves in
 the head of the pin.
- 30 5. A plug as claimed in any one of claims 1 to 4 wherein
 the catches extend from the base of the plug adjacent to
 grooves formed in the plug.
- 35 6. A plug as claimed in any one of claims 1 to 5 wherein
 one of the pins is retained in its aperture by means of a
 catch acting in the head of the pin under a position where

Pat nts Act 1977
 Examiner's report to the Comptroller under
 Section 17 (The Search Report)

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Application number
 9200611.3

Relevant Technical fields

(i) UK Cl (Edition K) H2E [EDAA E253]

(ii) Int Cl (Edition 5) H01R

Search Examiner

F J FEE

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search

2 APRIL 1992

Documents considered relevant following a search in respect of claims 1 TO 9

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
P X	EP 0420010 A1 (AMP) eg figures 67, latches 50	1, 2

SF2(p)

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Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

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